Amendments to the Claims

The following listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. (CURRENTLY AMENDED) A computer implemented method for determining the optimal focal height for an objective lens coupled with a line scan camera in a virtual microscopy system prior to scanning a microscope slide, comprising:

identifying a plurality of focus points on a microscope slide;

positioning an objective lens coupled with a line scan camera over a first focus point;

scanning an image of the first focus point at a plurality of objective lens heights;

determining the objective lens height having the greatest contrast in the scanned image; [.]

combining a plurality of objective lens heights into a non-planar focal surface, wherein an objective lens height at other than the plurality focus points is estimated; and

adjusting the height of the objective lens according to the non-planar focal surface during subsequent scanning of the microscope slide.

2. (CURRENTLY AMENDED) The method of claim 1, ~~further comprising~~ wherein combining a plurality of objective lens heights into a non-planar focal surface comprises:

connecting an objective lens height with a pair of neighboring objective lens heights to define a triangular region; and

combining a plurality of ~~objective lens heights into a~~ triangular regions into the non-planar focal surface~~; and~~

~~adjusting the height of the objective lens according to the focal surface during subsequent scanning of the microscope slide.~~

3. (CURRENTLY AMENDED) The method of claim 2, wherein the non-planar focal surface covers the entire microscope slide.

4. (CURRENTLY AMENDED) The method of claim 2, wherein the non-planar focal surface covers a sub-region of the microscope slide.

5. (ORIGINAL) The method of claim 4, wherein the sub-region substantially corresponds to the area of microscope slide comprising a specimen.

6. (ORIGINAL) The method of claim 4, wherein the sub-region substantially corresponds to an image stripe.

7. (CURRENTLY AMENDED) A computer implemented method for determining the optimal focal height for a plurality of objective lens locations in a virtual microscopy system prior to scanning a microscope slide, the virtual microscopy system having an objective lens coupled to a line scan camera and a stage for supporting a microscope slide, the method comprising:

moving the stage in a direction orthogonal to the objective lens;

continuously adjusting the height of the objective lens relative to the stage while the stage is in motion;

scanning an image of an area on the microscope slide while the stage is in motion and the height of the objective lens is continuously adjusted;

determining ~~an~~ a plurality of objective lens ~~location~~ locations having the greatest contrast in the scanned image.

8. (CURRENTLY AMENDED) The method of claim 7, wherein ~~the~~ an objective lens location comprises a planar location on the microscope slide and a height of the objective lens.

9. (CURRENTLY AMENDED) The method of claim 8, further comprising:

combining a plurality of objective lens locations into a non-planar focal surface, wherein an objective lens height on the focal surface at other than the plurality of objective lens locations is estimated; and

adjusting the height of the objective lens according to the non-planar focal surface during subsequent scanning of the microscope slide.

10. (CURRENTLY AMENDED) The method of claim 9, wherein the non-planar focal surface covers the entire microscope slide.

11. (CURRENTLY AMENDED) The method of claim 9, wherein the non-planar focal surface covers a sub-region of the microscope slide.

12. (ORIGINAL) The method of claim 11, wherein the sub-region substantially corresponds to the area of microscope slide comprising a specimen.

13. (ORIGINAL) The method of claim 11, wherein the sub-region substantially corresponds to an image stripe.

14. (NEW) A computer implemented method for creating a digital image of a specimen on a microscope slide, comprising:

determining a scan area comprising a region of the microscope slide that includes at least a portion of the specimen;

dividing the scan area into a plurality of linear strips that each comprise opposing edges of the scan area;

determining a plurality of first focus points on a first linear strip, wherein a focal point comprises a planar location on the microscope slide and an objective lens height;

creating a first focal surface for the first linear strip comprising each of the plurality of first focus points, wherein the objective lens height at points in the first focal surface other than said plurality of first focus points is estimated and the first focal surface is non-planar;

scanning an image of the first linear strip, wherein the height of the objective lens relative to the microscope slide follows the predetermined first focal surface;

determining a plurality of second focus points on a second linear strip;

creating a second focal surface for the second linear strip comprising each of the plurality of second focus points, wherein the objective lens height at points in the second focal surface other than said plurality of second focus points is estimated and the second focal surface is non-planar;

scanning an image of the second linear strip, wherein the height of the objective lens relative to the microscope slide follows the predetermined second focal surface; and

composing the image of the first linear strip and the image of the second linear strip into a contiguous image of the specimen.

15. (NEW) The method of claim 14, wherein determining a plurality of focus points on a linear strip comprises:

moving the stage in a direction orthogonal to the objective lens;

continuously adjusting the height of the objective lens relative to the stage along a predetermined path while the stage is in motion;

scanning image data of the linear strip while the stage is in motion and the height of the objective lens is continuously adjusted; and

determining a plurality of objective lens heights having the greatest contrast in the scanned image.

16. (NEW) The method of claim 15, wherein the predetermined path followed by the objective lens relative to the stage is one of sinusoidal, triangular, and saw-tooth.

17. (NEW) The method of claim 14, wherein creating a focal surface comprises:

connecting a focus point with a pair of neighboring focus points to define a triangular region; and

combining a plurality of triangular regions into a non-planar focal surface.

18. (NEW) The method of claim 17, wherein the plurality of focus points includes at least four focus points.